

IN THE CLAIMS

Please amend the claims as follows:

1 (Currently Amended). A gain switching circuit ~~that switches~~ configured to switch a conversion gain of a preamplifier, the preamplifier ~~outputting being configured to output~~ a voltage signal by amplifying an output current of a photo-detecting element ~~that converts~~ configured to convert a burst optical signal into an electrical signal, the preamplifier being configured with a first series circuit formed with a first resistor and a first switching element and a second series circuit formed with a second resistor and a second switching element respectively connected in parallel with a feedback resistor, the gain switching circuit inputting a first gain switching signal defining a period for switching to a first conversion gain and a second gain switching signal defining a period for switching to a second conversion gain, said first gain switching signal and said second gain switching signal originating from outside of the gain switching circuit ~~upon receiving an output from the preamplifier~~, the gain switching circuit comprising:

a first operating unit ~~that generates~~ configured to generate a first switching element operating signal ~~for closing to close~~ the first switching element ~~within in response to the voltage signal output by the preamplifier being above a first threshold during the period -first gain switching period~~ defined by the first gain switching signal originating from outside the gain switching circuit; and

a second operating unit ~~that generates~~ configured to generate a second switching element operating signal ~~for closing to close~~ the second switching element ~~within in response to the voltage signal output by the preamplifier being above a second threshold during the period second gain switching period~~ defined by the second gain switching signal originating from outside the gain switching circuit.

2 (Currently Amended). The gain switching circuit according to claim 1, wherein the first gain switching signal defining the period for switching to the first conversion gain is different from the second gain switching signal defining the period for switching to the second conversion gain.

3 (Currently Amended). The gain switching circuit according to claim 1, wherein ~~closing of the second switching element by the second operating unit~~ is configured to close the second switching element within the second gain switching period ~~is enabled after the first switching element is closed by the first operating unit within the first gain switching period~~ closes the first switching element.

4 (Canceled).

5 (Currently Amended). The gain switching circuit according to claim ~~[[4]]~~ 1, wherein following relation is satisfied

$$V1 < kV2$$

where V1 is the first ~~discrimination level~~ threshold, V2 is the second ~~discrimination level~~ threshold ~~is V2~~, and k is an amount of lowering a gain of the preamplifier when the first switching element is closed based on the first ~~discrimination level~~ threshold.

6 (Currently Amended). A gain switching circuit ~~that switches~~ configured to switch a conversion gain of a preamplifier, the preamplifier ~~outputting~~ being configured to output a voltage signal by amplifying an output current of a photo-detecting element configured to convert ~~that converts~~ a burst optical signal into an electrical signal, the preamplifier being configured with a first series circuit formed with a first resistor and a first switching element

and a second series circuit formed with a second resistor and a second switching element respectively connected in parallel with a feedback resistor, the gain switching circuit comprising:

a gate generating circuit ~~that generates, upon receiving an output of the preamplifier,~~
configured to generate a gate signal for switching to a predetermined conversion gain within
~~a gain switching period~~ defining a period for switching to a predetermined conversion gain;

a first operating unit ~~that generates~~ configured to generate a first switching element
operating signal ~~for closing to close~~ a first switching element ~~within~~ in response to the
voltage signal output by the preamplifier being above a first threshold during the gain
~~switching period~~ the period defined by the gate signal generated by the gate generating
circuit; and

a second operating unit ~~that generates~~ configured to generate a second switching
element operating signal ~~for closing to close~~ a second switching element ~~within~~ in response
to the voltage signal output by the preamplifier being above a second threshold during the
~~gain switching period~~ the period defined by the gate signal generated by the gate generating
circuit.

7 (Currently Amended). The gain switching circuit according to claim 6, wherein
~~closing of the second switching element by the second operating unit is~~ configured to
close the second switching element enabled after the first operating unit closes the first
~~switching element is closed by the first operating unit within the gain switching period.~~

8 (Canceled).

9 (Currently Amended). The gain switching circuit according to claim ~~[[8]]~~ 1, wherein

the gate generating circuit includes a counter circuit that generates a clock signal, and
the gate generating circuit generates a gate signal having a time width of a
predetermined number of clocks by using the clock signal generated by the counter circuit.

10 (Currently Amended). The gain switching circuit according to claim 7, wherein
when the first switching element operating signal is generated using ~~[[a]]~~ the first
~~discrimination level threshold~~ and the second switching element operating signal is generated
using ~~[[a]]~~ the second ~~discrimination level threshold~~, the gate generating circuit generates the
gate signal based on a third discrimination level and a fourth discrimination level that satisfy

$$V_{10} < V_{11} < V_1 \text{ and } V_{10} < V_{11} < V_2$$

where V_1 is the first ~~discrimination level threshold~~, V_2 is the second ~~discrimination level~~
threshold, V_{10} is the third ~~discrimination level threshold~~, and V_{11} is the fourth
~~discrimination level threshold~~.

11 (Currently Amended). The gain switching circuit according to claim 10, wherein
the gate generating circuit includes

a first variation-point detecting circuit ~~that detects~~ configured to detect a
variation point of a signal that is detected at the third discrimination level; and

a second variation-point detecting circuit ~~that detects~~ configured to detect a
variation point of a signal that is detected at the fourth discrimination level, and

the gate generating circuit ~~generates~~ is configured to generate a logical product
signal of a first basic gate signal that is generated by the first variation-point detecting circuit
with a time width of a predetermined variation point count length and a second basic gate
signal that is generated by the second variation-point detecting circuit with a time width of a
predetermined variation point count length as the gate signal.